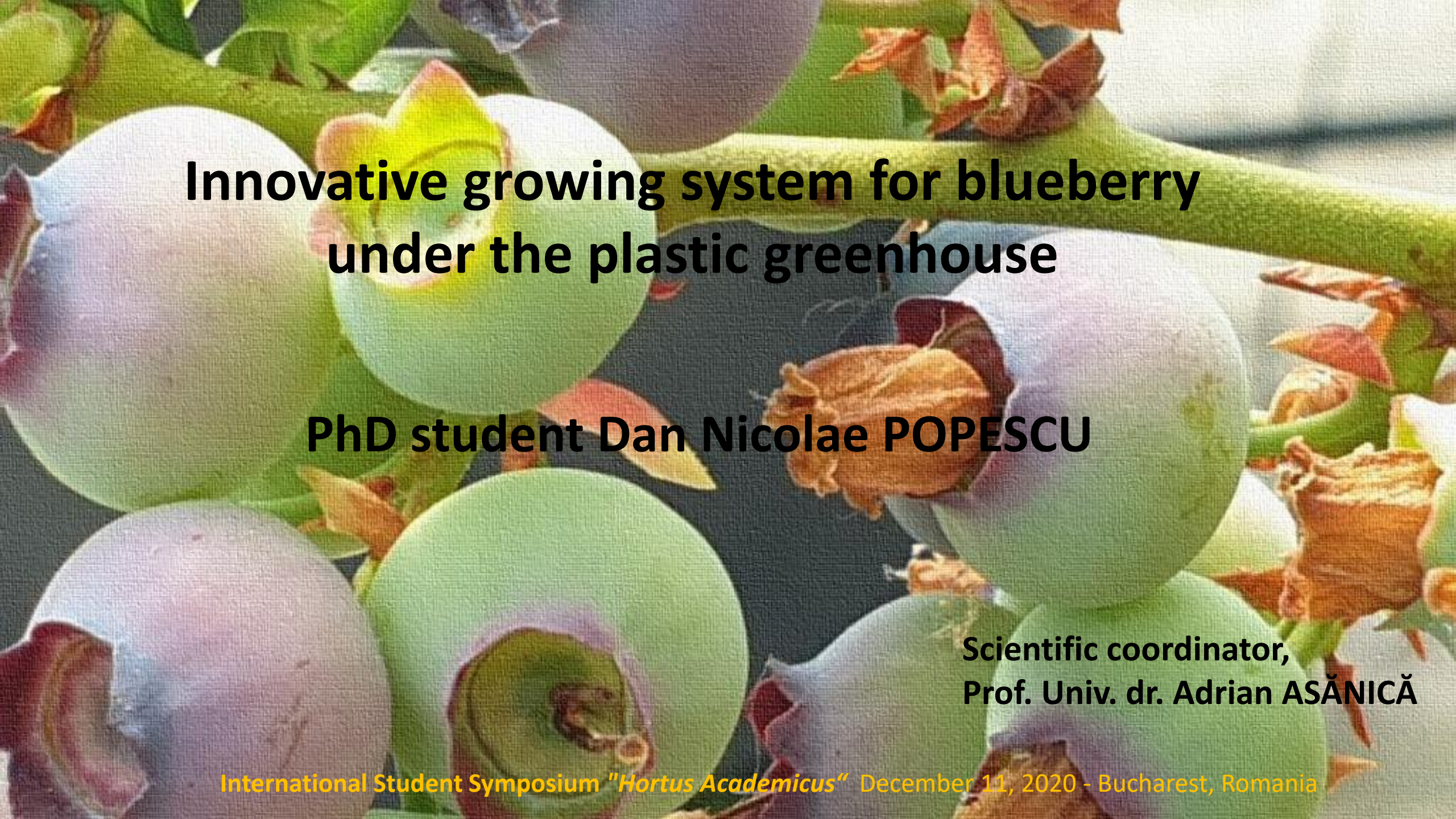

Innovative growing system for blueberry under the plastic greenhouse

PhD student Dan Nicolae POPESCU

Scientific coordinator,
Prof. Univ. dr. Adrian ASĂNICĂ

International Student Symposium *"Hortus Academicus"* December 11, 2020 - Bucharest, Romania

University of Agronomic Sciences and Veterinary Medicine of Bucharest
Faculty of Horticulture

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Innovative growing system for blueberry under the plastic greenhouse

PhD **Dan Nicolae POPESCU**

Coordinator Prof.dr. Adrian ASĂNICĂ

Rationales

- Market demand for organic blueberries
- Enlarge the fresh fruits consumption period by growing berries in the greenhouse conditions
- Tailored technologies for organic growing system
- Effectiveness of organic fertilizers
- Efficiency of certified crop protection products
- Urban horticulture best practices support in growing fruits ready to eat

Experimental blueberry plot at USAMV Bucharest (2020)

Research goals

1. Testing containerized blueberry early varieties in the greenhouse and organic production system

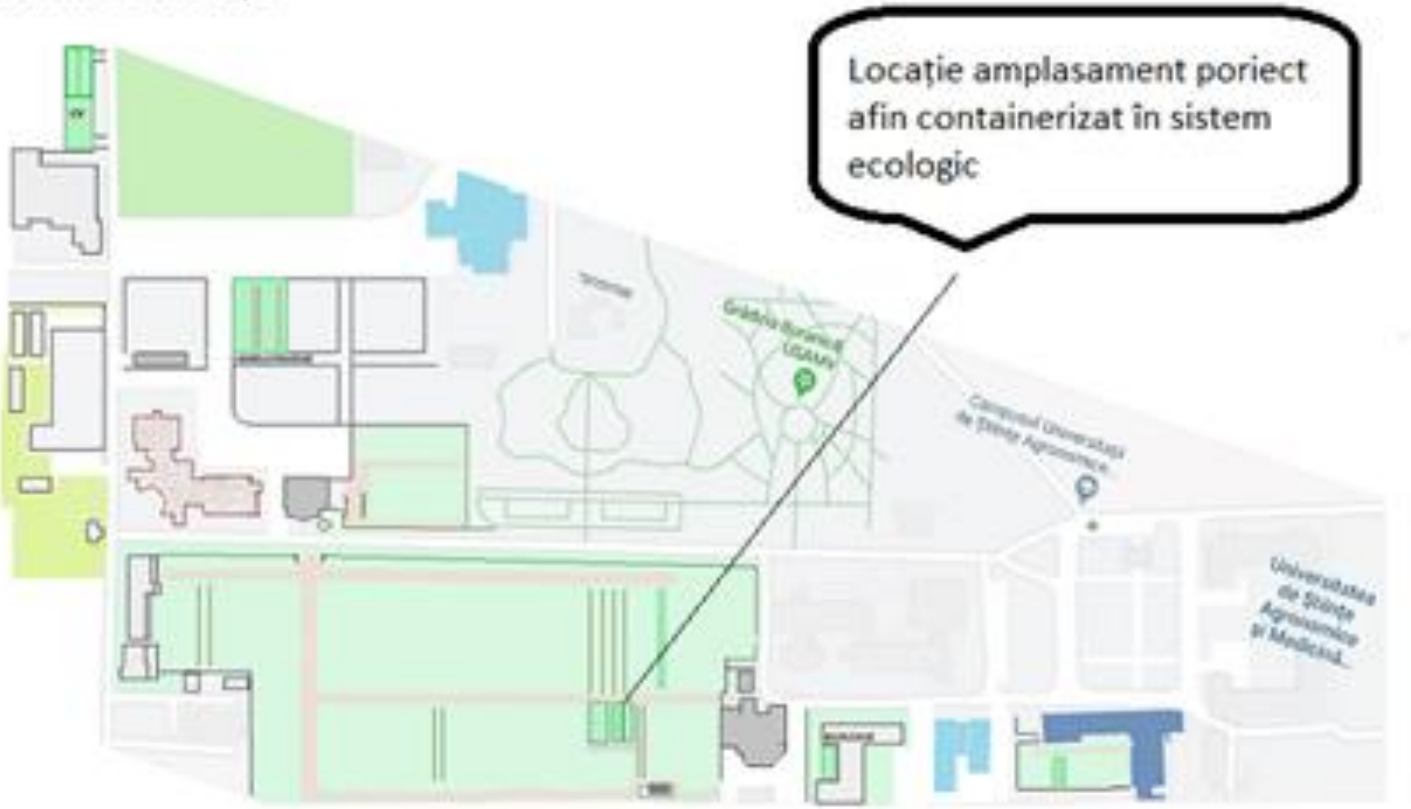
2. Evaluation of growth and blueberry yield

3. Quality assessment of the blueberry fruits

4. Design the fertilization and protection scheme in the experimental research framework

Where we are

Campusul USAMV București



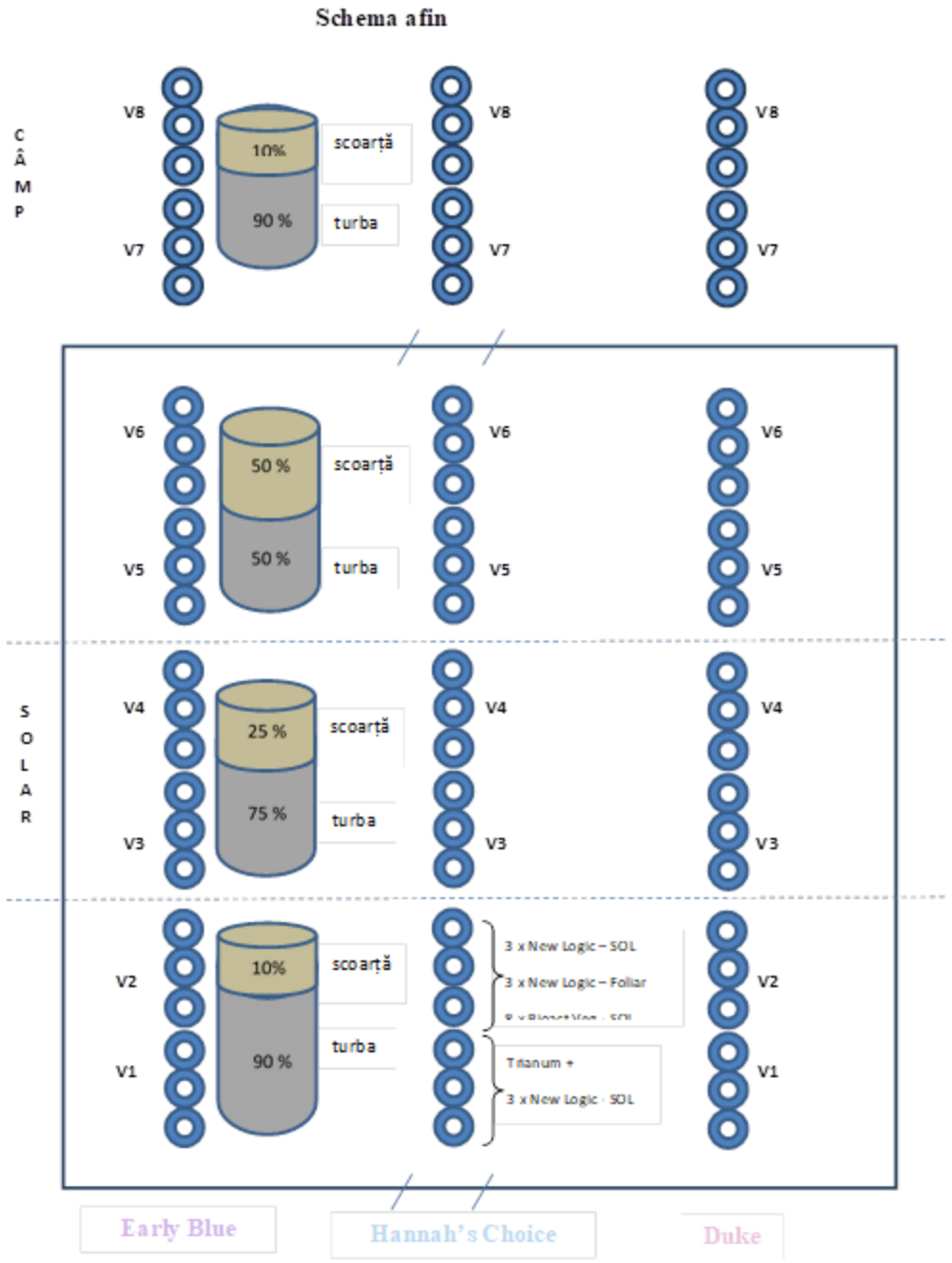
Livada facultății de horticultură

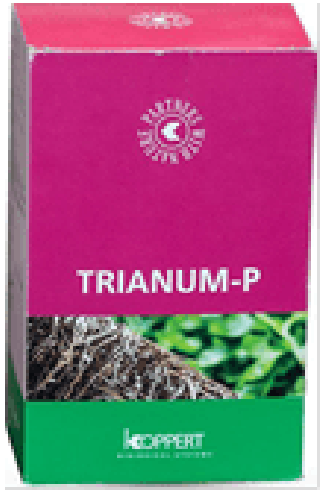
Project start: early 2019

Solar: size 18m x 6m

Folie: Ginegar Suncover Nectarin 150 microns (87% light transmision, 35% light diffusion, 85% terminicity); UV trans 300-380 mm – 45%
Mulch: agrotextil
Irrigation: Drip stick of 6 l/h, 3 x emitters/container;
Substrate: mixture of different share of acid peat Kekkila FBM525 Vaccinium and pine bark.

- a. Peat 90% + pine bark 10%;
- b. Peat 75% + pine bark 25%;
- c. Peat 50% + pine bark 50%.





Nutrition: organic fertilizers
New Logic, BioactVeg foliar and soil application;
Trianum-P - one time application at the planting time.

Organic certified protection products

Blueberry varieties: Early blue, Duke, Hannah's Choice.

Duke

HC

Early blue

Treatment application scheme - 2019

Perioada		22.04.2019 – 22.09.2019							
Nr. tratamente		1	2	3	4	5	6	7	8
PROTAMIN		22.04.							
TRANUM - P		22.04.							
NEW LOGIC	foliar	15.07.	18.07.	23.07.					
	radicula	03.05.	22.07	05.08.					
BIOAT VEG	foliar	20.06.	11.07.	18.07.	23.07.	30.07.	22.08.	10.09.	20.09
	radicular	11.05.	24.05.	20.06.	29.06.	25.07.	13.08.	26.08.	16.09

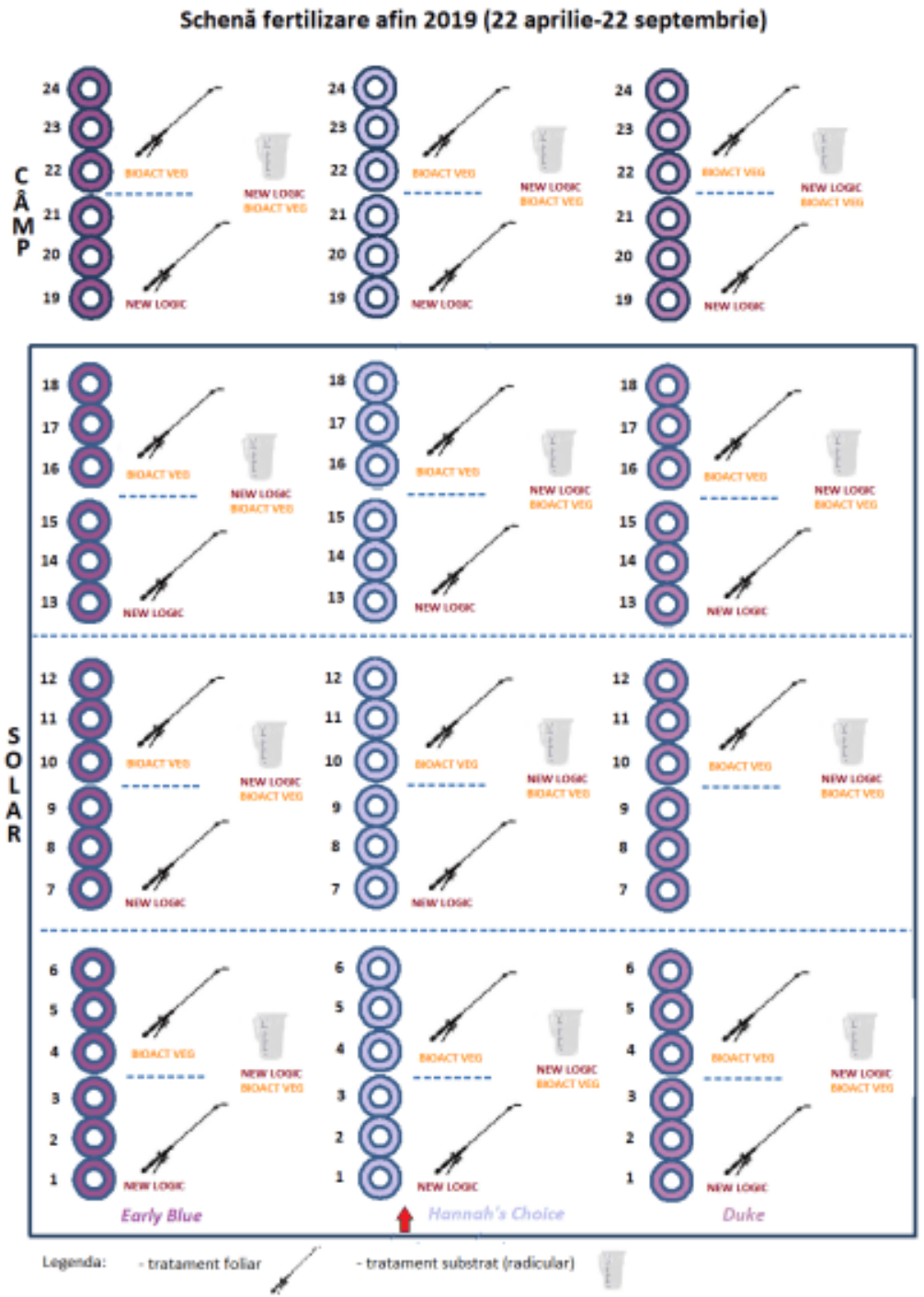
Application period: 22.04 ….. 22.09.2019

20.04 ….. 19.09.2020

No of applications: 24 / year

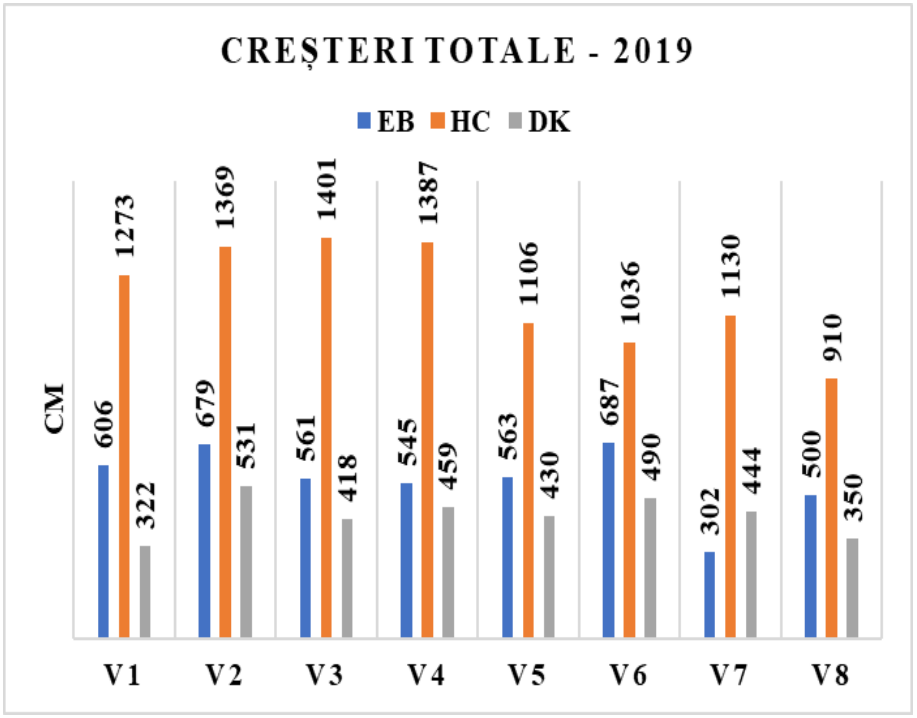
Fertilization method: leaf and in the substrate

No of organic products used: 4



RESULTS

Hannah's Choice growing potential



	creșteri totale- 2019			
	EB	HC	DK	(∑)
V1	606	1273	322	2201
V2	679	1369	531	2579
V3	561	1401	418	2380
V4	545	1387	459	2391
V5	563	1106	430	2099
V6	687	1036	490	2213
V7	302	1130	444	1876
V8	500	910	350	1760
(∑)	4444	9611	3444	

More than one meter growth / season

15 days earliness of the covered blueberry crop vs outdoor plants

Bud burst order:

1. Hannah’s Choice
2. Early blue
3. Duke.

EB – **15.05.2020** solar ;
20.05.2020 first blue fruits

HC – **20.05.2020**
solar – start of coloring fruits

DK – **20.05.2020** solar;
28.05.2020 first blue fruits appearance

<u>05 June 2020</u>
first pick !

Early blue - 70 days from blossom to fruit harvest

Duke - 87-90 days from flower to fruit coloring and 99 days to harvest time.

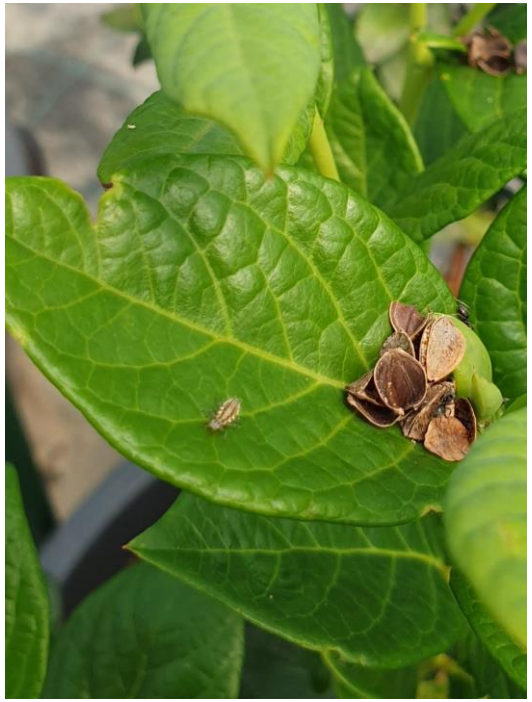
Hannah's Choice - 90-95 days from flower to ripened fruit

Organic protection products efficiency

Produsul aplicat	Data tratamentului	Concentratia	Eficienta
Laser 240 SC	28 mai2019	6 ml sol/ 10 l apa	F bun
GAREX B	17 iulie 2019	10 ml sol/ 10 l apa	mediu
PREV-AM	18 iulie2019	60 ml sol/ 10 l apa	mediu
DEFFORT	25 iulie 2019	30 ml sol/ 10 l apa	mediu
GAREX B	30 iulie 2019	60 ml sol/ 10 l apa	mediu
DEFFORT + PREV-AM	31 iulie 2019	25 ml sol DEF + 60 ml sol PREV-AM / 10 l apa	slab
Chrisopa	10 august 2019	Chrisopela carnea	excelent
PREV-AM + DEFFORT	26 august 2019	PREV-AM 40 ml + DEF 30ml /10 l apa	slab
PREV-AM + LASER	29 august 2019	PREV-AM 40 ml + LASER 5 ml / 10 l apa	slab
Chrisopa	31 august 2019	Chrisopela carnea	F bun

Laser
- very good effect in first application
- Less efficiency in the second application
- Good effect on control first aphids attack

Chrysoperla carnea – excellent natural predator for aphids, trips

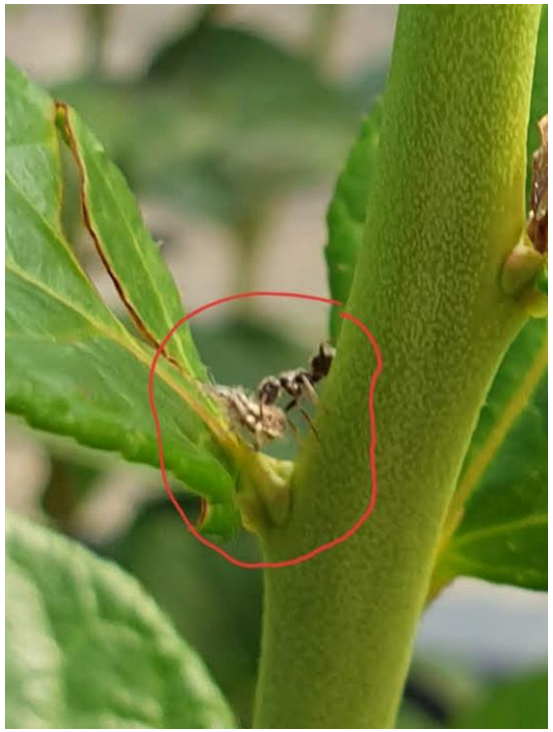


Ways of using Crysopa from Koppert

On the top of the substrate

On the plant leaves near the aphids

Special boxes hanging near top of the affected shoots

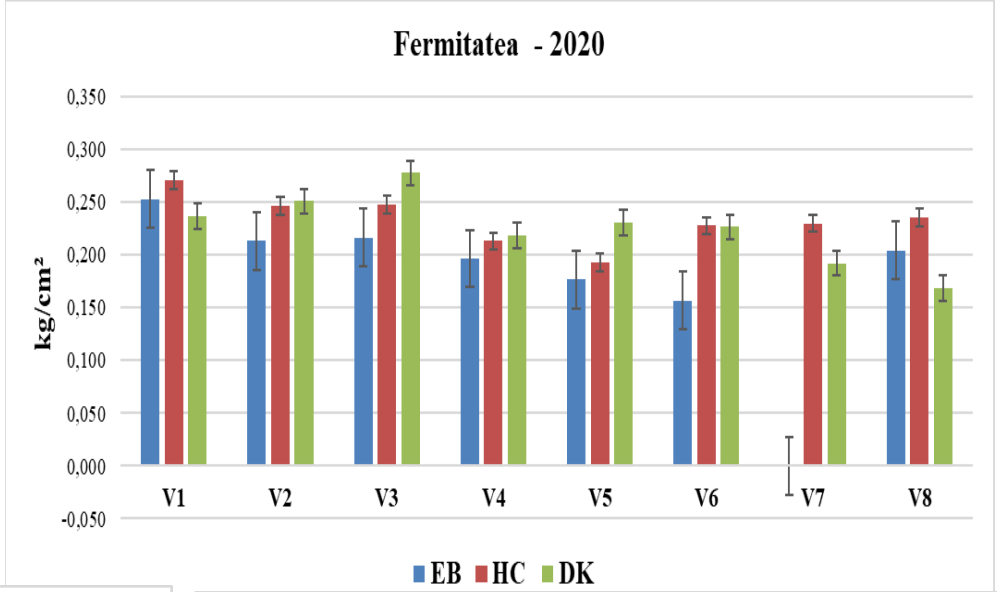


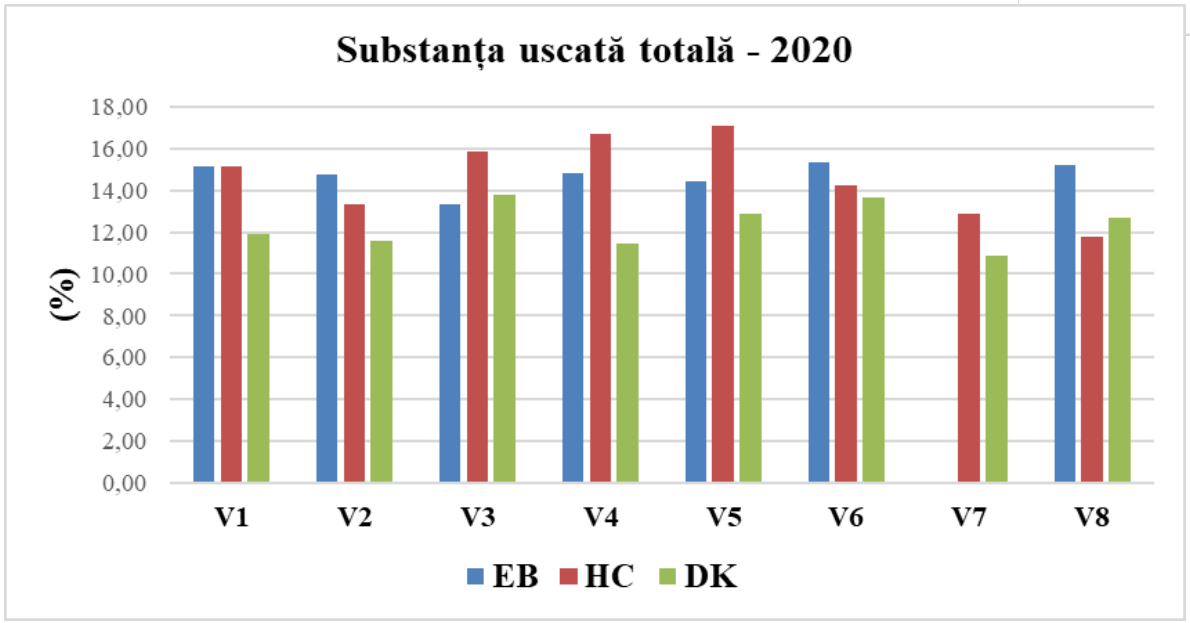
Crysoppela enemies !
The ants ….

Quality of the early blueberry varieties

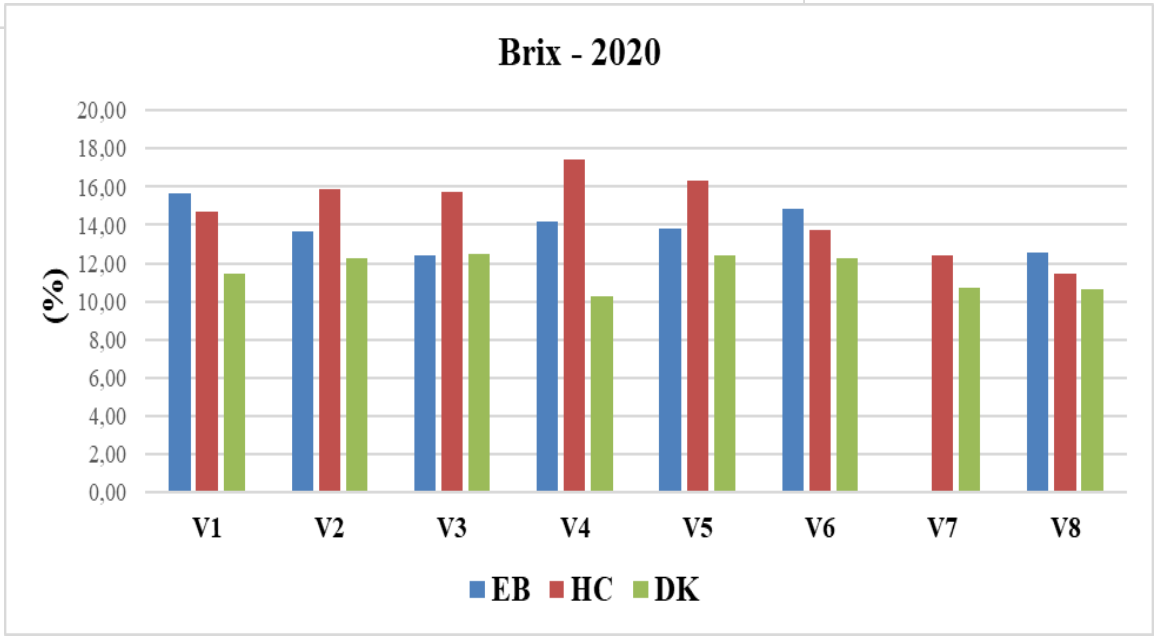
a. pH
b. Total titratable acidity
c. Soluble dry substance (%)
d. Glucose (%)
e. Fructose (%)
f. Total dry substance content (%)
g. Firmness

Hannah's Choice and **Duke**
– high fruit firmness





Hannah's Choice & **Early blue** –
highest total dry substance content



Hannah's choice – the sweetest fruits
Early blue- in the second place

Conclusions

- Best substrate mixture:

Peat 90% + Pine bark 10% followed by
Peat 75% + Pine bark 25%

- Foliar treatments did not demonstrate a great influence on growth and productivity of the plants

- New Logic and Bioact Veg showed to be suitable for organic fertilization

- Laser is a professional product with high efficiency on controlling aphids in one time application
- Complementary products from Naturevo did not overcome the following waves of insects
- **Chrisopela Carnea (Crysopa)** – was the best solution in aphids combat method. Even after 28 days from launching the predator is active.

Best early blueberry variety in terms of firmness : **Hannah’s Choice**

Good taste and sugar content: **Hannah’s Choice, Early blue**

Large fruits and greatest appearance: **Duke**

Thank you for your attention !